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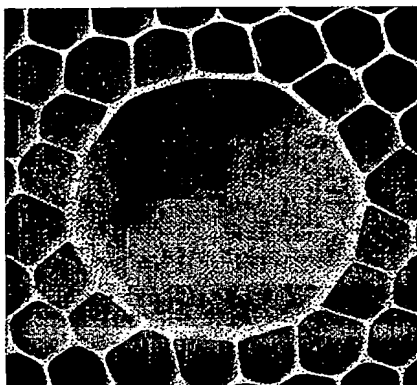
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(54) Title: **PHOTONIC BANDGAP OPTICAL WAVEGUIDE WITH ANTI-RESONANT CORE BOUNDARY**



(57) Abstract: Improved photonic band-gap optical fibre The present invention relates in particular to improved photonic band-gap optical fibres that can confine light to a core region of the fibre by the action of both a photonic band-gap cladding and an antiresonant core boundary, at the interface between the core and cladding. According to embodiments of the present invention, a fibre has a core, comprising an elongate region of relatively low refractive index, a photonic bandgap structure arranged to provide a photonic bandgap over a range of wavelengths of light including an operating wavelength of light, the structure, in a transverse cross section of the waveguide, surrounding the core and comprising elongate relatively low refractive index regions interspersed with elongate relatively high refractive index regions and a relatively high refractive index boundary at the interface between the core defect and the photonic bandgap structure, the boundary having a thickness around the core such that the boundary is substantially anti-resonant at the operating wavelength of the fibre. In preferred embodiments, the core boundary is a relatively constant thickness region of glass around a hollow core.

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